

What is claimed is:

1. An image processing device, comprising:
  - a region extraction unit for separating and extracting a character region, a graphic region and a photograph region
  - 5 from image data;
  - a region compression unit for performing a compression process for each of the region data extracted by said region extraction unit;
  - 10 a region synthesis unit for synthesizing the region data compressed by said region compression unit; and
  - a compression method selection unit for selecting a compression method of the compression process to be performed for each of the region data extracted by said region extraction unit from among a plurality of compression methods designated
  - 15 individually for types of the region data;
  - said region compression unit performing the compression process for each of the region data using the compression method selected for the region data by said compression method selection unit.
- 20 2. An image processing device, comprising:
  - a region extraction unit for separating and extracting a character region, a graphic region and a photograph region from image data;
  - a region compression unit for performing a compression

process for each of the region data extracted by said region extraction unit;

a region synthesis unit for synthesizing the region data compressed by said region compression unit; and

5 a compression process mode setting unit for setting a speed preference mode as a compression process mode;

said region compression unit using, when the speed preference mode is set by said compression process mode setting unit, one of a plurality of compression methods designated  
10 for each of the region data which exhibits the highest processing speed to perform the compression process for the individual region data.

3. An image processing device, comprising:

a region extraction unit for separating and extracting  
15 a character region, a graphic region and a photograph region from image data;

a region compression unit for performing a compression process for each of the region data extracted by said region extraction unit;

20 a region synthesis unit for synthesizing the region data compressed by said region compression unit; and

a compression process mode setting unit for setting a picture quality preference mode as a compression processing mode;

said region compression unit using, when the picture quality preference mode is set by said compression process mode setting unit, one of a plurality of compression methods designated for each of the region data which exhibits the 5 least picture quality deterioration to perform the compression process for the individual region data.

4. An image processing device, comprising:  
    a region extraction unit for separating and extracting  
    a character region, a graphic region and a photograph region  
10    from image data;

    a region compression unit for performing a compression process for each of the region data extracted by said region extraction unit;

    a region synthesis unit for synthesizing the region data  
15    compressed by said region compression unit; and

    a compression process mode setting unit for setting a size preference mode as a compression processing mode;

    said region compression unit using, when the size preference mode is set by said compression process mode setting unit, one of a plurality of compression methods designated for each of the region data which exhibits the highest compression ratio to perform the compression process for the individual region data.  
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5. An image processing device, comprising:

a region extraction unit for separating and extracting  
a character region, a graphic region and a photograph region  
from image data;

a region compression unit for performing a compression  
5 process for each of the region data extracted by said region  
extraction unit;

a region synthesis unit for synthesizing the region data  
compressed by said region compression unit; and

a compression process mode setting unit for setting a  
10 speed preference mode, a picture quality preference mode or  
a size preference mode as a compression processing mode;

    said region compression unit using, when the speed  
preference mode is set by said compression process mode setting  
unit, one of a plurality of compression methods designated  
15 for each of the region data which exhibits the highest  
processing speed to perform the compression process for the  
individual region data, said region compression unit using,  
when the picture quality preference mode is set by said  
compression process mode setting unit, one of a plurality  
20 of compression methods designated for each of the region data  
which exhibits the least picture quality deterioration to  
perform the compression process for the individual region  
data, and said region compression unit using, when the size  
preference mode is set by said compression process mode setting

unit, one of a plurality of compression methods designated for each of the region data which exhibits the highest compression ratio to perform the compression process for the individual region data.

5        6. An image processing device, comprising:

      a object extraction unit for interpreting a document file described in a page description language, and extracting a object which is a component of the document file,

10      a object compression unit for performing a compression process for each of the object data extracted by said object extraction unit;

      a object synthesis unit for synthesizing the object data compressed by said object compression unit; and

15      a compression method selection unit for selecting a compression method of the compression process to be performed for each of the object data extracted by said object extraction unit from among a plurality of compression methods designated individually for types of the object data;

      said object compression unit performing the compression process for each of the object data using the compression method selected for the object data by said compression method selection unit.

7. An image processing method, comprising:

      a region extraction step of separating and extracting

a character region, a graphic region and a photograph region from image data;

a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

a region synthesis step of synthesizing the region data compressed by said region compression step; and

a compression method selection step of selecting a compression method of the compression process to be performed for each of the region data extracted by said region extraction step from among a plurality of compression methods designated individually for types of the region data;

said region compression step performing the compression process for each of the region data using the compression method selected for the region data by said compression method selection step.

8. An image processing method, comprising:

a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

a region synthesis step of synthesizing the region data

compressed by said region compression step; and

a compression process mode setting step of setting a speed preference mode as a compression process mode;

said region compression step using, when the speed  
5 preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated for each of the region data which exhibits the highest processing speed to perform the compression process for the individual region data.

10 9. An image processing method, comprising:

a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

15 a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

a region synthesis step of synthesizing the region data compressed by said region compression step; and

20 a compression process mode setting step of setting a picture quality preference mode as a compression processing mode;

said region compression step using, when the picture quality preference mode is set by said compression process mode setting step, one of a plurality of compression methods

designated for each of the region data which exhibits the least picture quality deterioration to perform the compression process for the individual region data.

10. An image processing method, comprising:

5        a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

10        a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

15        a region synthesis step of synthesizing the region data compressed by said region compression step; and

20        a compression process mode setting step of setting a size preference mode as a compression processing mode;

25        said region compression step using, when the size preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated for each of the region data which exhibits the highest compression ratio to perform the compression process for the individual region data.

11. An image processing method, comprising:

25        a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

- 5        a region synthesis step of synthesizing the region data compressed by said region compression step; and

          a compression process mode setting step of setting a speed preference mode, a picture quality preference mode or a size preference mode as a compression processing mode;

- 10      said region compression step using, when the speed preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated for each of the region data which exhibits the highest processing speed to perform the compression process for the individual region data, said region compression step using,
- 15      when the picture quality preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated for each of the region data which exhibits the least picture quality deterioration to perform the compression process for the individual region data, and said region compression step using, when the size preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated for each of the region data which exhibits the highest compression ratio to perform the compression process for the

individual region data.

12. An image processing program for causing an image processing device to execute:

a region extraction step of separating and extracting

5 a character region, a graphic region and a photograph region from image data;

a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

10 a region synthesis step of synthesizing the region data compressed by said region compression step; and

a compression method selection step of selecting a compression method of the compression process to be performed for each of the region data extracted by said region extraction

15 step from among a plurality of compression methods designated individually for types of the region data;

said region compression step performing the compression process for each of the region data using the compression method selected for the region data by said compression method

20 selection step.

13. An image processing program for causing an image processing device to execute:

a region extraction step of separating and extracting a character region, a graphic region and a photograph region

from image data;

a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

5 a region synthesis step of synthesizing the region data compressed by said region compression step; and

a compression process mode setting step of setting a speed preference mode as a compression process mode;

said region compression step using, when the speed  
10 preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated for each of the region data which exhibits the highest processing speed to perform the compression process for the individual region data.

15 14. An image processing program for causing an image processing device to execute:

a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

20 a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

a region synthesis step of synthesizing the region data compressed by said region compression step; and

a compression process mode setting step of setting a picture quality preference mode as a compression processing mode;

said region compression step using, when the picture  
5 quality preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated for each of the region data which exhibits the least picture quality deterioration to perform the compression process for the individual region data.

10 15. An image processing program for causing an image processing device to execute:

a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

15 a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

a region synthesis step of synthesizing the region data compressed by said region compression step; and

20 a compression process mode setting step of setting a size preference mode as a compression processing mode;

said region compression step using, when the size preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated

for each of the region data which exhibits the highest compression ratio to perform the compression process for the individual region data.

16. An image processing program for causing an image  
5 processing device to execute:

a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

10 a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

a region synthesis step of synthesizing the region data compressed by said region compression step; and

15 a compression process mode setting step of setting a speed preference mode, a picture quality preference mode or a size preference mode as a compression processing mode;

said region compression step using, when the speed preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated

20 for each of the region data which exhibits the highest processing speed to perform the compression process for the individual region data, said region compression step using, when the picture quality preference mode is set by said compression process mode setting step, one of a plurality

of compression methods designated for each of the region data which exhibits the least picture quality deterioration to perform the compression process for the individual region data, and said region compression step using, when the size  
5 preference mode is set by said compression process mode setting step, one of a plurality of compression methods designated for each of the region data which exhibits the highest compression ratio to perform the compression process for the individual region data.

10 17. A computer-readable recording medium on which the image processing program according to claim 16 is recorded.

18. An image processing device, comprising:  
a region extraction unit for separating and extracting a character region, a graphic region and a photograph region  
15 from image data;

a region compression unit for performing a compression process for each of the region data extracted by said region extraction unit;

20 a region synthesis unit for synthesizing the region data compressed by said region compression unit; and  
an image size calculation unit for calculating an image size of specific region data extracted by said region extraction unit;

said region compression unit using, when the image size

of the specific region data calculated by said image size calculation unit is equal to or greater than a threshold value, a first compression method to perform the compression process for the specific region data, and said region compression unit using, when the image size of the specific region data calculated by said image size calculation unit is smaller than the threshold value, a second compression method to perform the compression process for the specific region data.

19. The image processing device according to claim 18,  
10 wherein,

the first compression method is a compression method in which the image size after the compression process is greater than the image size before the compression process, when it is applied to the specific region data whose image size before  
15 the compression process is smaller than the threshold value, and

the second compression method is a compression method in which the image size after the compression process is not greater than the image size before the compression process,  
20 when it is applied to the specific region data whose image size before the compression process is smaller than the threshold value.

20. The image processing device according to claim 18,  
wherein the first compression method is a default compression

method for the specific region data.

21. The image processing device according to claim 18,  
wherein the specific region data is character region data.

22. The image processing device according to claim 21,  
5 wherein the first compression method is the MMR compression  
and the second compression method is the Flate compression.

23. An image processing device, comprising:  
a object extraction unit for interpreting a document  
file described in a page description language, and extracting  
10 a object which is a component of the document file,

a object compression unit for performing a compression  
process for each of the object data extracted by said object  
extraction unit;

15 a object synthesis unit for synthesizing the object data  
compressed by said object compression unit;

an image size calculation unit for calculating an image  
size of the object data extracted by said object extraction  
unit; and

20 a compression method selection unit for selecting a  
compression method of the compression process to be performed  
for each of the object data extracted by said object extraction  
unit in proportion to the image size of the object data  
calculated by said image size calculation unit from among  
a plurality of designated compression methods;

said object compression unit performing the compression process for each of the object data using the compression method selected for the object data by said compression method selection unit.

- 5       24. The image processing device according to claim 23, wherein,

    said compression method selection unit selecting , when the image size of the object data calculated by said image size calculation unit is equal to or greater than a threshold 10 value, a first compression method to perform the compression process for the object data, and said compression method selection unit selecting, when the image size of the object data calculated by said image size calculation unit is smaller than the threshold value, a second compression method to 15 perform the compression process for the object data.

25. The image processing device according to claim 24, wherein,

    the first compression method is a compression method in which the image size after the compression process is greater 20 than the image size before the compression process, when it is applied to the object data whose image size before the compression process is smaller than the threshold value, and  
    the second compression method is a compression method in which the image size after the compression process is not

greater than the image size before the compression process, when it is applied to the object data whose image size before the compression process is smaller than the threshold value.

26. An image processing method, comprising:

5        a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

10      a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

15      a region synthesis step of synthesizing the region data compressed by said region compression step; and

20      an image size calculation step of calculating an image size of specific region data extracted by said region extraction step;

25      said region compression step using, when the image size of the specific region data calculated by said image size calculation step is equal to or greater than a threshold value, a first compression method to perform the compression process for the specific region data, and said region compression step using, when the image size of the specific region data calculated by said image size calculation step is smaller than the threshold value, a second compression method to perform the compression process for the specific region data.

27. The image processing method according to claim 26,  
wherein,

the first compression method is a compression method  
in which the image size after the compression process is greater  
5 than the image size before the compression process, when it  
is applied to the specific region data whose image size before  
the compression process is smaller than the threshold value,  
and

the second compression method is a compression method  
10 in which the image size after the compression process is not  
greater than the image size before the compression process,  
when it is applied to the specific region data whose image  
size before the compression process is smaller than the  
threshold value.

15 28. The image processing method according to claim 26,  
wherein the first compression method is a default compression  
method for the specific region data.

29. The image processing method according to claim 26,  
wherein the specific region data is character region data.

20 30. The image processing method according to claim 29,  
wherein the first compression method is the MMR compression  
and the second compression method is the Flate compression.

31. An image processing method, comprising:  
a character region extraction step of separating and

extracting character regions from image data;

an image size calculation step of calculating an image size of each of the character region data extracted by said character region extraction step;

- 5        a compression method selection step of selecting, when the image size of each of the character region data calculated by said image size calculation step is equal to or greater than a threshold value, the MMR compression as a compression method but selecting, when the image size of each of the character region data calculated by said image size calculation step is smaller than the threshold value, the Flate compression as a compression method; and
- 10

a region compression step of performing a compression process for each of the character region data using the compression method selected by said compression method selection step.

32. An image processing program for causing an image processing device to execute:

- 15
  - 20
- a region extraction step of separating and extracting a character region, a graphic region and a photograph region from image data;

a region compression step of performing a compression process for each of the region data extracted by said region extraction step;

a region synthesis step of synthesizing the region data compressed by said region compression step; and

an image size calculation step of calculating an image size of specific region data extracted by said region  
5 extraction step;

said region compression step using, when the image size of the specific region data calculated by said image size calculation step is equal to or greater than a threshold value, a first compression method to perform the compression process  
10 for the specific region data, and said region compression step using, when the image size of the specific region data calculated by said image size calculation step is smaller than the threshold value, a second compression method to perform the compression process for the specific region data.

15        33. The image processing program according to claim 32, wherein,

the first compression method is a compression method in which the image size after the compression process is greater than the image size before the compression process, when it  
20 is applied to the specific region data whose image size before the compression process is smaller than the threshold value, and

the second compression method is a compression method in which the image size after the compression process is not

greater than the image size before the compression process, when it is applied to the specific region data whose image size before the compression process is smaller than the threshold value.

5        34. The image processing program according to claim 32, wherein the first compression method is a default compression method for the specific region data.

35. The image processing program according to claim 32, wherein the specific region data is character region data.

10      36. The image processing program according to claim 35, wherein the first compression method is the MMR compression and the second compression method is the Flate compression.

37. The computer-readable recording medium on which the image processing program according to claim 32 is recorded.

15      38. An image processing program for causing an image processing device to execute:

      a character region extraction step of separating and extracting character regions from image data;

20      an image size calculation step of calculating an image size of each of the character region data extracted by said character region extraction step;

      a compression method selection step of selecting, when the image size of each of the character region data calculated by said image size calculation step is equal to or greater

than a threshold value, the MMR compression as a compression method but selecting, when the image size of each of the character region data calculated by said image size calculation step is smaller than the threshold value, the

5 Flate compression as a compression method; and

a region compression step of performing a compression process for each of the character region data using the compression method selected by said compression method selection step.

10 39. The computer-readable recording medium on which the image processing program according to claim 38 is recorded.